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ABSTRACT

These guidelines describe both the role and preparation of a Program of Requirements (POR) in the planning and design of capital improvements projects. The purpose of POR is to define very clearly facility needs and objectives to the designer. The POR consists of five parts: (1) the title page; (2) part A, a summary of the project and general information to acquaint the designer and others with anticipated funding, site concerns, general characteristics of the program, general institutional requirements, and a listing of the participants involved in the project; (3) part B, a summary of the desired facilities; (4) part C, a description, in detail, of the use, specifications and contents for each room/area/facility identified in the preceding part B; and (5) appendices. The five parts of a POR are discussed separately, along with sample formats and sample illustrations. (SI)

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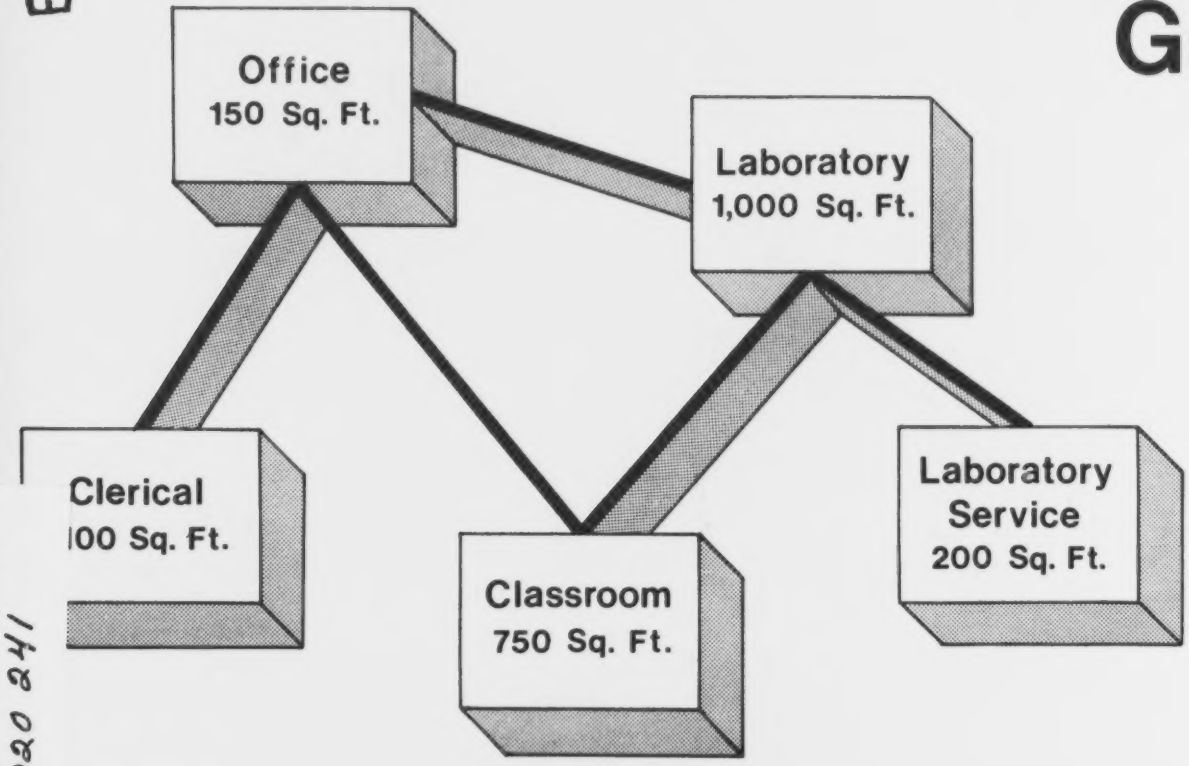

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GUIDELINES FOR DEVELOPING A PROGRAM OF REQUIREMENTS

COUNCIL OF EDUCATIONAL FACILTY PLANNERS, INTERNATIONAL
JULY 1985

GUIDELINES FOR DEVELOPING A PROGRAM OF REQUIREMENTS

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Purpose

These guidelines describe both the role and preparation of a Program of Requirements (POR) in the planning and design of capital improvements projects.

A POR may be used for any type of capital improvements project—new construction, remodeling or renovation, and for utility or other campus improvement projects.

The POR is not a project design. Its purpose is to define very clearly facility needs and objectives which become both challenges and charges to the designer. In short, the POR describes the design problem which is to be solved through the design process.

Background Information

What is a Program of Requirements?

A POR is, essentially, a set of functional requirements, expressed in narrative and outline form, which describes in detail the facilities required to serve the program to be accommodated.

The POR identifies and describes each type of facility to be included in a project of terms of functional use, fixed equipment, movable equipment, utilities, services, number of occupants, priority, and affinity to other facilities.

Why is a Program of Requirements necessary?

Among the many reasons for a well prepared POR are:

1. provides the designer with a clearly stated set of project goals, requirements and priorities.
2. requires a deliberate, item by item consideration of facilities by those involved in the planning process, including the agency (academic department, administrative unit, etc.) or persons who will use the completed facility.
3. helps assure university administration and capital funds providers that funds are being used effectively and efficiently for the purpose authorized.
4. serves as an evaluation instrument for reviewing the project drawings as developed by the designer in their several stages.

The designer is usually charged with achieving the facilities as described in the program in their priority order; and is often prohibited from adding facilities not contained in the POR unless changes have been processed through and approved by the appropriate university and/or public agencies. A POR may be prepared in advance of project funding, especially if there is reasonable certainty that funds will be allocated, so that design may begin immediately after funds are available. In some cases planning and design funds only may be provided in which case a POR should be prepared.

When is a Program of Requirements prepared?

In instances where a project is needed but funding is uncertain, it is often best to hold preparing a POR until the funding picture clarifies. A POR prepared too far in advance may need major revision or even complete rewriting due to changes in the programs to be accommodated by a project. In many situations, however, funding agency requirements may establish when a POR is prepared.

Who prepares the Program of Requirements?

At many campuses, the office responsible for campus planning, capital planning or facilities planning is administratively responsible for the preparation and processing of all PORs for capital improvements projects.

The ultimate beneficiary of a project, the using agency or department, is expected to provide detailed information in the preliminary stages of POR development. The ultimate user is most familiar with the myriad details, relationships and physical facility needs of the program or service to be accommodated by the project.

Preparing basic materials for a POR may provide an occasion for the agency involved to re-think the program which the capital improvements project will serve. If one accepts the premise that capital facilities exist primarily to serve teaching, research and public service programs or their supporting services, and that the nature of facilities derives from how the program is organized and conducted, it follows that thoughtful reflection about program is needed to prepare POR information. For most departments, capital improvements projects do not occur frequently. When they do, the resulting facilities may affect the quality of program for many years. It is useful, then, to see the work of preparing POR information as an opportunity to review the program thoroughly.

How is the Preparation of a Program of Requirements initiated?

At an appropriate time, the institutional office responsible for preparing a POR contacts representatives of the using agency to discuss plans for the development of the program. A timetable is established, responsibility is assigned for preparing basic information and questions about content and format are considered.

What format should a Program of Requirements follow?

The POR may consist of five parts as follows:

(1) - Title Page
(2) - General—Part A
(3) - Summary of Requirements—Part B
(4) - Detailed Description of Facilities Required—Part C
(5) - Standard Appendices

Each of these parts is discussed separately, along with sample formats and sample illustrations, in subsequent sections of these guidelines.

Title Page

The title page may contain the following information:

1. **Complete Project Title**
   The title should identify the facility name and whether the project is new construction, renovation/remodeling or a combination of both.
2. **Name of Campus**
3. **Office of agency having responsibility for the preparation of the program**
4. **Date**

PART A — General

Part A is a general introduction to the Program of Requirements. It is a summary of the project and contains general information to acquaint the designer, and others, with anticipated funding, site concerns, the programs of the unit(s) to be accommodated by the project and general institutional requirements to be achieved by the project. Information contained in Part A may be presented in the following format. Examples of each entry are provided.

1. **Name of Project**

2. **Scope of Project**
   A statement of the overall objective of the project. Major elements of the scope of work included are identified in a series of brief paragraphs.

3. **Project Budget**
   A statement indicating the expected amount of funding and sources of that funding. A breakdown of fund allocations to construction, fees, equipment, site development, contingency reserve, etc., may also be included. Budget constraints may be discussed further in an appendix to the program. (See Appendix I.)

4. **Site**
   This section contains site requirements essential to the design. Proposed project site location(s) are shown on sketches, either as an attachment to this paragraph or in an appendix to the program. (See Appendix II.) Proposed site sketches will indicate the locations of existing utilities lines, roads, walkways, etc. This paragraph also identifies special siting considerations that must be accommodated.

   References to the campus master plan or other campus siting documents may be included in this section.

5. **General Characteristics of the Program to be Accommodated**
   Describe the academic, support, and/or administrative programs of the unit that will use the facility achieved by the project. This information enhances understanding of the types of space required, the functions to be accomplished within the space and relationships between various kinds of space/facilities.

   Types of information which may be described in this section could include:

   1. The mission, goals or objectives of the program served by the project—a brief summary.
   2. Importance of the program to the overall institutional mission.
   3. General types of activities which are included in the program to be accommodated.
   4. Types and numbers of people involved.
   5. Operations schedule or frequency.
   6. Relationships of the program to other institutional programs, especially for support and service (e.g., relation of an academic program to library services).

6. **General Characteristics of the Project**
   This section is intended to emphasize major design considerations necessary to assure that the completed facilities achieve and support the program characteristics summarized in the previous section. Specific space considerations, such as ceiling heights, utilities systems complexities, environmental control requirements,

special interior finishes, unusual public access problems, special security needs, interior space flexibility and the like are highlighted to assist the designer in understanding user needs.

While each program item description, contained in Part C, will define special utilities services requirements for that particular area or room, it is important that this section fully describe the overall building systems required. These general characteristics must recognize all of the building systems involved, e.g., heating, ventilation, cooling, electrical, telephone and data communications, etc., including the inter-relationships involved to insure that the project designer fully understands the intent and what is to be achieved.

A list of items, of critical importance to the designer before initiating design, includes, but is not limited to:

a. Needs, if any, for special temperature or humidity control in certain areas of the project;

b. The "point to point" responsibility of the designer with regard to each, and all, "extension of utilities" required by the project;

c. Unusual utilities such as central building compressed air, demineralized water, vacuum distribution, etc.

This understanding is especially important in remodeling or renovation projects where the renovation of a cooling system might also have substantial impact on the associated heating system.

7. Participants in Project Planning Conferences

A listing is provided of persons who will represent various institutional offices or officers, including the ultimate using agency, during the planning and design review conferences. It is very helpful if the using agency representative be completely familiar with the "user needs", be available for frequent consultation, and function as the user's "single point of contact" from initiation of the POR through completion of construction.

PART B — Summary of Desired Facilities

A properly and completely developed Part B can be very useful. During program preparation, it should be developed and kept up to date as a quick and handy check on status and programs.

After the program of requirements is completed, Part B becomes essentially an index/table of contents to the following Part C (which describes each space in detail).

The structuring of Part B (identification of space/facilities) should be along organizational/functional lines or grouped according to major academic or administrative areas. It is important that all facility requirements be listed in Part B.

A program item number, arranged to indicate sequentially the placement of the item within the POR, is assigned to each facility or group of facilities. A decimal program item numbering system can be helpful because it can give an indication of space relationships and affinities. For example, an office suite could be number and titled thus:

1.0 College Office Suite
- 1.1 Dean's Office
  - 1.1.1 Reception/waiting
  - 1.1.2 Dean's secretary
  - 1.1.3 Dean's conference room
- 1.2 Associate Dean's Offices (2)
  - 1.2.1 Secretarial offices (2)
  - 1.2.2 Work Room
- 1.3 College Placement Office
  - 1.3.1 Counsellor Offices (3)
  - 1.3.2 Interview Rooms (4)
- 1.4 Student Organization Offices (3)

An appropriate priority (1,2 or 3) is also indicated for each program item. Definition of priorities is contained in the introduction to Part B (see format). After the POR is completed, page numbers for each POR item may be added to Part B.

Part B, and the following Part C, may identify only those facilities required by the using agency in support of programmatic needs. That space usually can be identified as Assignable Square Feet (ASF). Building service space, e.g., heating, ventilation and air conditioning equipment rooms, electrical equipment rooms, toilets, circulation space (corridors, elevators, etc.), telephone and data communications rooms, janitorial closets, etc., may or may not be identified in the POR. If not, these building services areas are provided by the designer in addition to the ASF in response to guidance from the university architect and/or the university's design standards and applicable public building codes. In certain instances, e.g., hospitals, dormitories, etc., special requirements for toilets/showers are included as ASF space(s).

A SUGGESTED FORMAT AND WORDING FOR PART B

PART B — Summary of Desired Facilities

The following summary identifies, in outline form, the facilities/spaces required. Each item number refers to a specific type of room, facility or suite, to be achieved.

Priorites applicable to each item number are also indicated. Priority 1 and 2 items are considered essential and achievable within the established construction budget. As the design progresses, the project designer may determine that all of the priority 2 items are not achievable within the budget. If so it may be necessary to include some or all as "add alternates" to the project. Decisions about which priority 2 to place in the add alternate category are made by the Planning Committee with advice from the designer. Priority 3 items represent desirable facilities which should be included in the design if possible but may not be achievable within the established construction budget unless the designer can effect economies in the design of the higher priority items or favorable bids are received. Priority 3 items that may not be considered achievable within the construction budget can be designed and included in the bidding process as "lower add alternates" unless determined otherwise by the Planning Committee. As a guide, for planning purposes, priority 1 items might account for 75 to 80 percent of the assignable square feet (ASF) of space estimated in the program, with 10 to 15 percent assigned to priority 2 and 10 to 15 percent assigned to priority 3. The difference between the anticipated ASF and the estimated gross square feet (GSF) represents the allowance for building non-assignable space, e.g., building services, circulation, mechanical rooms, elevators, etc., and must be reserved for these uses.

The planning of priority 2 and 3 items requires careful consideration to assure that these items are truly "deletable" or "addable" to the design. These priority distributions are necessary to facilitate decisions that arise during the design phases and the subsequent bidding process.

Detailed descriptions for each program item number are contained in Part C.

Program Item Number	Item Name	Priority	Page

(List Item Number and complete name with the Priority of the item. The Page number can be entered once Part C is completed.)

PART C — Description of Each Facility

This section of the POR describes, in detail, the use, specifications and contents for each room/area/facility identified in the preceding Part B. These descriptions should be detailed to help the designer understand the function of the facility, the equipment (both fixed and movable) to be used in the space, the number of occupants and what they do, the kinds of services and utilities required to achieve the functional needs, the location of this particular facility with respect to other items in the project and, finally, with priority of the facility being described. The format presented below represents the definition of a new building. Where a remodeling/renovation is being described, the description should also identify the specific facility or room number affected by the modification and contain a description of the scope of work envisioned as a part of the renovation and/or remodeling.

Where applicable, building floor layout should be included for remodeling projects to help identify the extent of work to be performed in each room (Appendix III).

There is much disagreement among facility planners about whether facility size estimates should be included with the descriptive material in Part C. Of course, where size and dimensions are critical to function, as with athletic courts or fields, they should be included. Most of the disagreement focuses on rooms in a new building construction. There are reasonable arguments both for and against including room size estimates in a POR. One point is clear: the designer must accept the responsibility to establish room sizes in the light of functions, services and equipment information whether size estimates are provided in the POR or not. This points up the need to provide as much information and detail as possible in the POR so that room sizes are not determined primarily by earlier estimates or by some average or standard.

In writing the detail for Part C, it is often difficult to distinguish "movable" and "fixed equipment". The POR must clearly indicate, especially to the designer, the user's intent with respect to "equipment" to assure that the intent is recognized and included in the design and subsequent construction. A few general guidelines are offered below. It is recognized that these guidelines will not fit all applications. Discussions should occur between the designer and Planning Committee to assure understanding.

Fixed equipment includes all equipment that is to be provided and installed by one or more of the prime contractors. Under most circumstances, fixed equipment is attached to and becomes part of the building after the project is completed. Easily identified items of fixed equipment include chalkboards, bulletin boards, laboratory case work, including sinks, and certain other fixtures/appurtenances.

Examples of not easily identifiable fixed equipment might include environmental rooms, growth chambers and other equipment requiring permanent, or semi-permanent, connection of utilities/services but which themselves are not attached to the building.

Movable equipment, as the "label" implies, represents equipment that does not require major installation and is not affixed to the building. A movable equipment budget is often established within the total project budget, but outside the construction budget, to fund movable equipment purchases. Authorized movable equipment items are usually purchased in accordance with current university purchasing procedures. Examples of movable equipment include furniture items, bench top/table top equipment and equipment not requiring extensive utility connections.

A check list is provided (Appendix IV) to help assure that critical requirements are not inadvertently overlooked during preparation of detailed descriptions.

A SUGGESTED FORMAT FOR PART C

Program Item Number **Item Name**

Estimated Size:
Enter the estimated size of each facility in square feet, acres, sq. yds., etc. (optional)

Number Required:
Enter number of these facilities required. If more than one is required and priorities vary, indicate number of rooms by priority in Priority paragraph, below

Occupants or Users:
Enter maximum number of persons using facility at any one time; e.g., one staff member and up to three visitors, etc.

Use of Facility:
A concise, but descriptive, statement of the types of activity conducted.

Fixed Equipment:
Identify types and numbers required for all equipment/furnishings to be installed by one of the construction contractors. Dimensions, especially those indicating amount of floor space, are essential. These items could include chalkboards, bulletin boards, laboratory benches and case work, laboratory equipment that is connected to the building, etc.

Movable Equipment:
Identify types and numbers required for all movable equipment which requires floor space or utility connections. Include horizontal dimensions for each item using floor space and utility connection needs for all items, including those used on a work surface even though no floor space is affected.

Services:
Identify services required, such as telephone, computer terminal connections, electrical outlets, water, drain lines, etc.

Special Requirements:
Identify all special needs that will be of concern to the designer, such as:
1) unusual utilities needs of the equipment listed if not listed with the equipment
2) special types or finish for floors, walls, ceilings, etc.
3) other than normal sized doors
4) special ceiling heights

5) any special need that the designer must provide in order for the facility to function properly
6) special operating hours, particularly if only part of the facility is affected
7) unusual environment tolerances for humidity and temperature
8) special visual or sonic environment needs or tolerances

Affinity:

Identify the location of this facility in relation to others in the project. Such terms as direct access to, convenient to, adjacent to, are helpful. If there are none write "not critical".

Priority:

The assigned priority (1, 2 or 3) of this facility. If more than one priority applies to several facilities of one type, indicate number by priority.

APPENDICES

The following are examples of appendices which may be inserted at the end of each POR where appropriate. They should be altered to recognize concerns/conditions peculiar to a specific program.

Appendix I should be applicable to most programs. Appendix II is required only for new construction projects; however, a site plan and/or existing building layouts should be included in programs for renovation and remodeling projects (Appendix III).

Appendix IV is a checklist to assist in the preparation of idividual program item descriptions, and is not a part of the completed program.

SAMPLE
APPENDIX I

Project Budget

Project budget, as stated in Part A, often must include all project costs, and produce a complete project ready for occupancy. Among the items which may be included are:

1. Demolition costs.
2. Construction costs.
3. Alteration costs made necessary by the new construction.
4. Site development, including walks, drives, parking areas, lawns and plantings.
5. Extension of all utilities required to service the facility (electrical, gas, water, steam, storm and sanitary sewers, telecommunications services, chilled water, etc.).
6. Site preparation.
7. Test borings and site survey.
8. Plan inspection.
9. Duplication of drawings, etc.
10. Advertising.
11. All fees—university or other public agency supervising architect, project architect and/or engineers, design consultants, etc.
12. Construction contingency funds.
13. Fixed and movable equipment, including fees and installation costs.

SAMPLE
APPENDIX II

Site Consideration

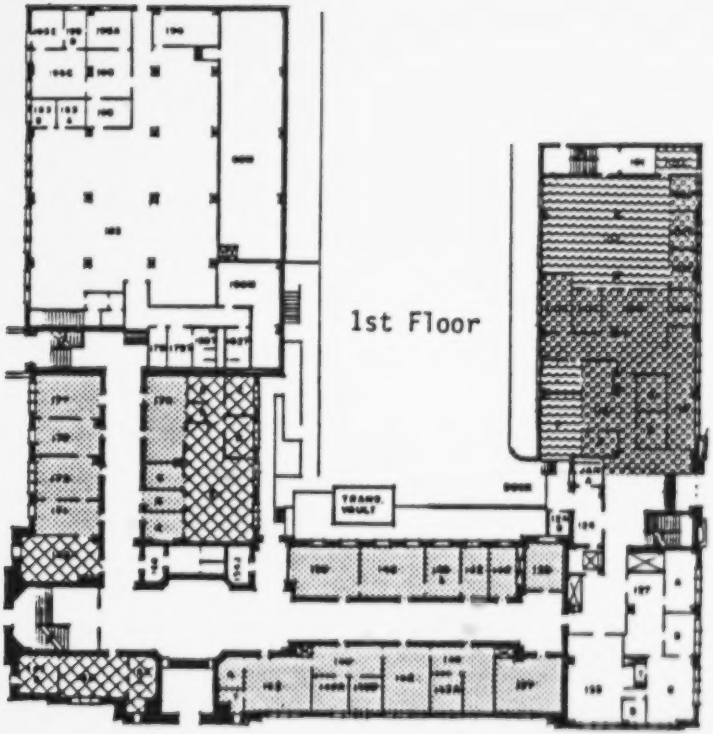
Site requirements are approved along with the POR for a project. Normally, as much freedom as possible is allowed the project designer in developing the siting solution so long as the solution meets the environmental specifications in the POR and conforms to the campus planning requirements.

If the project designer believes that a substantially better solution might be achieved by deviating from the siting stipulations regarding the project, he/she should request a conference with the institutional office responsible for POR preparation.

Drives, walks, parking areas, service entrances, and planting areas should be planned after consultation with the institutional office responsible for POR preparation relative to future plans that might affect the project. Proposals for site development will then be considered in conference the same as other plans for the project.

SAMPLE
APPENDIX III

Scope of Renovation/Remodeling Work Required



Requires major renovation*(old section of building) and remodeling (some interior redesign necessary).

Requires major renovation* (old section of building) and general refurbishing but no interior redesign.

Requires installation of central air conditioning, interior wall modifications and general refurbishing.

Requires only interior wall modifications and general refurbishing.

Requires only general refurbishing for new occupant - no remodeling necessary.

No work required.

*Includes installation of central air conditioning; window and door replacement; and ceiling and lighting replacement.

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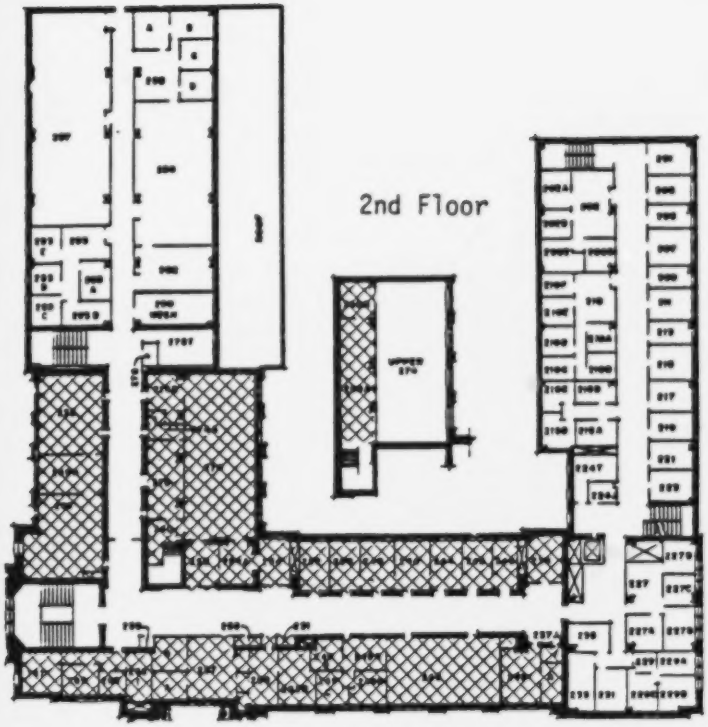

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SAMPLE
APPENDIX IV

Detailed Requirements Checklist

This checklist is provided to assist those preparing detailed item descriptions contained in Part C of the POR. It is intended to prevent the writer from inadvertently overlooking critical requirements.

Note: **The checklist is not included in the completed Program of Requirements.**

I. Environmental Characteristics:

a. Ceiling Height: Any special requirements
If special, state clear height _____

b. Circulation:

Large door openings required (Specify size)
Any special requirements (Specify size)

c. Heating, air conditioning and ventilation:

Standard for building is all that is required or must all space be air-conditioned

Special exhaust is required for:
Excessive heat
Vapors
Smoke
Radioactivity

Accurate temperature control required

If so, state range from _____ to _____ °F and limits plus or minus _____ °F

Accurate humidity control required

If yes, give range from _____ to _____% RH and limits plus or minus _____% RH

Other—(Specify)

d. Safety: Any special requirements

Alarms
Safety shower
Eye wash
Volatile liquid storage
Other safety?—(Specify)

e. Noise:

Is there a need for sound attenuation?

Will this activity produce noise disturbing to others?

f. Lighting: Any special requirements

Is natural daylight needed
Above average intensity
Ultra violet required
Dimmer control
Black out capability

g. Hazards:

Fire
Noxious fumes
Acids
Contamination
Electrical
Spillage
Waste
Radioactivity
Others—(Specify)

h. Other:

Will the work being carried out be adversely affected by:
Radio interference
Vibration
Magnetism
Other—(Specify)

II. Communications and Audio/Visual Requirements

Telephone(s)
Paging
Intercom
Data Communications
Closed circuit TV
Cable TV
Projection Equipment
Chalkboards (specify type, quantity, and sizes)
Tack boards (specify quantity and sizes)
Other items

III. Equipment

a. Fixed Equipment

Laboratory casework/benches (with dimensions)
Installed shelving (with dimensions)
Mounted or attached equipment items
Utilities services required by equipment
Power requirement for equipment

b. Movable Equipment

Have all items affecting space needs been identified (with dimensions).
Power and/or utilities services, if required.
Develop movable equipment list, with estimated prices, for submittal with the POR.